Operating Instructions

BRINKMANN Immersion Pumps

TH/STH11…TH/STH17

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Brinkmann Immersions Pumps of the Series TH/STH11 ... TH/STH17

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1 Indication to the manual

This operating manual gives basic instructions which are to be observed during installation, operation and maintenance of the pump. It is therefore imperative that this manual be read by the responsible personnel and operator prior to assembly and commissioning. It is always to be kept available at the installation site.

1.1 Identification of safety instructions in the operating manual

Safety instructions given in this manual non-compliance with which would affect **safety** are identified by the following symbol

Safety sign according with ISO 3864 – B.3.1

or where **electrical safety** is involved, with:

Safety sign according with ISO 3864 – B.3.6

Where non-compliance with the safety instructions may cause a risk to the machine and it's function the word

ATTENTION

is inserted.

2 Description of the Product

2.1 General description of the pump

Pumps of this type are multi-stage rotary pumps. Series TH/STH use closed impellers in order to minimizing power consumption and to optimize hydraulic pump efficiencies. In addition, the TH/STH series offers high pressures at short immersion depths.
The pump shaft and the motor shaft are connected by a coupling. The pump shaft is sealed by a rotating mechanical seal. The pump is protected again impurity by a filter. Pump and motor form a compact and space-saving unit.

Vertically mounted pumps are equipped with a mounting flange. The pump end immerses into the tank and the motor extends vertically above the tank.

2.2 Intended use

The immersion pumps of the series TH/STH have been especially developed to supply internally cooled tools with coolant fluid within the limiting application in accordance with table 1.

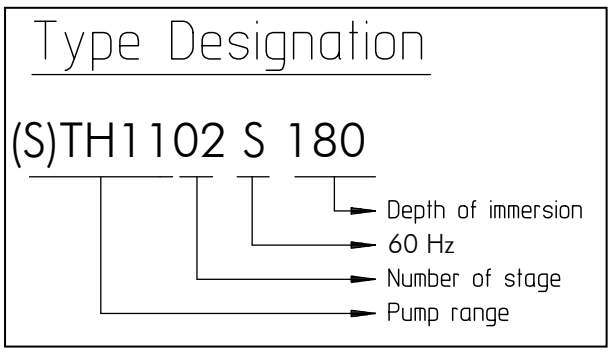
Limit of Application (Table 1)

Type	TH/STH11…17
Mediums	Industry water, coolant, cooling- and cutting-oils
Kinetic viscosity of the medium	…115 SSU *(...25 mm²/s)*
Temperature of medium	30 … 175 °F *(0 ... 80 °C)*
Particle-size in the medium	0.04 Inches *(1 mm)*
max. operation pressure	390 PSI *(27 bar)*
min. delivery volume	1% of Q max.
Dry running	The pumps are not suitable for dry running.
Motor cycle time per hour	Motors less 4.0 HP max. 200 from 4.0 HP to 5.4 HP max. 40 from 6.7 HP to 14 HP max. 20 from 15.0 HP and higher max. 15
Ambient temperature	104 °F *(40 °C)*
Set-up altitude	3280 ft *(1000 m)*

ATTENTION

The pumps are to be operated within their design limits. Applications outside of these limits are not approved. The manufacturer is not responsible for any damages resulting from use of the pumps in such applications.

2.3 Type Designation



2.4 Technical data

Type	Max. del. pressure spec. weight 1 PSI	bar	Max. del. volume GPM	*l/min*	Height **H** Inches	*mm*	Depth of immersion **h** Inches	*mm*	Weight TH[1] lbs	*kg*	Power HP	*kW*	Noise level[2] 60 Hz dBA
(S)TH1102S180	50	*3.4*	74	*275*	16.0	*406*	7.17	*182*	75.0	*34*	1.75	*1.3*	66
(S)TH1103S180	78	*5.2*	75	*285*	17.0	*431*	7.17	*182*	83.8	*38*	2.5	*1.9*	66
(S)TH1104S280	100	*6.8*	76	*290*	17.4	*441*	10.94	*278*	90.4	*41*	3.5	*2.6*	66
(S)TH1105S280	124	*8.2*	78	*300*	19.5	*496*	10.94	*278*	114.7	*52*	4.4	*3.3*	74
(S)TH1106S280	150	*10.1*	80	*310*	19.5	*496*	10.94	*278*	121.3	*55*	5.4	*4.0*	74
(S)TH1107S310	177	*11.9*	82	*320*	20.9	*532*	12.2	*310*	158.8	*72*	6.7	*5.0*	74
(S)TH1108S380	200	*13.8*	84	*325*			14.72	*374*	163	*74*			
(S)TH1109S380	222	*15.6*	87	*330*	20.9	*532*	14.72	*374*	165	*75*	7.4	*5.5*	74
(S)TH1110S470	248	*17.2*	87	*330*	25.2	*640*	18.5	*470*	214	*97*	11.5	*8.6*	77
(S)TH1111S470	276	*19.0*	88	*335*					216	*98*			
(S)TH1112S470	300	*20.4*	89	*340*					218	*99*			
(S)TH1113S500	322	*22.1*	89	*340*	25.2	*640*	19.76	*502*	260	*118*	13.8	*10.3*	77
(S)TH1114S570	342	*23.8*	90	*350*			22.28	*566*	262	*119*			
(S)TH1115S570	362	*25.0*	90	*350*					265	*120*			

1) Weight STH = Weight TH + 4.4 lbs *(2 kg)*

2) Noise emissions measured in accordance with DIN 45635 at a distance of 39.37 Inches *(1 m)*

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

Type	Max. del. pressure spec. weight 1 PSI	bar	Max. del. volume GPM	*l/min*	Height **H** Inches	*mm*	Depth of immersion **h** Inches	*mm*	Weight TH[1] lbs	*kg*	Power HP	*kW*	Noise level[2] 60 Hz dBA
(S)TH1402S180	60	4.0	124	*460*	17.4	*441*	7.17	*182*	86.0	*39*	3.5	*2.6*	66
(S)TH1403S280	92	6.0	125	*475*	19.5	*496*	10.94	*278*	119.1	*54*	5.4	*4.0*	74
(S)TH1404S280	120	8.1	128	*490*	20.9	*532*	10.94	*278*	158.8	*72*	7.4	*5.5*	74
(S)TH1405S380	156	10.2	130	*500*	25.2	*640*	14.72	*374*	207	*94*	11.5	*8.6*	77
(S)TH1406S380	182	12.2	132	*510*					209	*95*			
(S)TH1407S470	218	14.4	135	*520*	25.2	*640*	18.5	*470*	254	115	13.8	*10.3*	77
(S)TH1408S470	242	16.4	138	*530*	25.5	*647*	18.5	*470*	271	*123*	17	*12.6*	79
(S)TH1409S570	277	18.6	142	*545*	37.5	*952*	22.28	*566*	284	*129*	23	*17.3*	81
(S)TH1410S570	300	20.8	143	*550*					289	*131*			
(S)TH1411S660	330	22.8	146	*560*			26.06	*662*	291	*132*			
(S)TH1412S660	360	25.0	148	*570*					293	*133*			

1) Weight STH = Weight TH + 4.4 lbs *(2 kg)*

2) Noise emissions measured in accordance with DIN 45635 at a distance of 39.37 Inches *(1 m)*

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

Type	Max. del. pressure spec. weight 1 PSI	bar	Max. del. volume GPM	*l/min*	Height **H** Inches	*mm*	Depth of immersion **h** Inches	*mm*	Weight TH[1] lbs	*kg*	Power HP	*kW*	Noise level[2] 60 Hz dBA
(S)TH1702S180	60	4.1	142	*550*	19.5	*496*	7.17	*182*	110	*50*	4.4	*3.3*	72
(S)TH1703S280	94	6.4	148	*555*	20.9	*532*	10.94	*278*	156	*71*	6.7	*5.0*	74
(S)TH1704S280	124	8.4	150	*570*	25.2	*640*	10.94	*278*	205	*93*	11.5	*8.6*	77
(S)TH1705S380	158	10.8	153	*580*	25.2	*640*	14.72	*374*	247	*112*	13.8	*10.3*	77
(S)TH1706S380	190	13.1	158	*600*	25.5	*647*	14.72	*374*	265	*120*	17	*12.6*	79
(S)TH1707S470	220	15.2	160	*605*	37.5	*952*	18.5	*470*	311	*141*	23	*17.3*	81
(S)TH1708S470	252	17.4	162	*610*					313	*142*			
(S)TH1709S570	283	19.7	165	*620*			22.28	*566*	318	*144*			
(S)TH1710S570	312	21.8	167	*630*	39.4	*1002*	22.28	*566*	342	*155*	29	*21.3*	81
(S)TH1711S660	346	24.0	170	*640*			26.06	*662*	346	*157*			

1) Weight STH = Weight TH + 4.4 lbs *(2 kg)*

2) Noise emissions measured in accordance with DIN 45635 at a distance of 39.37 Inches *(1 m)*

The motor is surface-cooled and compliant with DIN IEC 34 and EN 60034 (protection degree IP 55).

3 Safety instructions

When operating the pump, the safety instructions contained in this manual, the relevant national accident prevention regulations and any other service and safety instructions issued by the plant operator are to be observed.

3.1 Hazards in the event of non-compliance with the safety instructions

Non-compliance with the safety instructions may produce a risk to the personnel as well as to the environment and the machine and results in a loss of any right to claim damages.
For example, non-compliance may involve the following hazards:

- Failure of important functions of the machines/plant
- Failure of specified procedures of maintenance and repair
- Exposure of people to electrical, mechanical and chemical hazards
- Endangering the environment due to hazardous substances being released

3.2 Unauthorized modes of operation

- Pump may not be used in potentially explosive environments**!**
- Pump and discharge piping are not designed to hold any weight and may not be used as a step ladder.

3.3 Remaining Risk

Risk of Injury!
Risk of squeezing or crushing body parts when installing or removing the pump exists. Proper and secured lifting tools must be used.

Risk of burns!
The pump must have cooled down sufficiently prior to commencing any repair, maintenance or installation.

3.4 Qualification and training of operating personnel

The personnel responsible for operation, maintenance, inspection and assembly must be adequately qualified. Scope of responsibility and supervision of the personnel must be exactly defined by the plant operator. If the staff does not have the necessary knowledge, they must be trained and instructed, which may be performed by the machine manufacturer or supplier on behalf of the plant operator. Moreover, the plant operator is to make sure that the contents of the operating manual are fully understood by the personnel.

3.5 Safety instructions relevant for operation

- If hot or cold machine components involve hazards, they must be guarded against accidental contact.
- Guards for moving parts (e.g. coupling) must not be removed from the machine while in operation.
- Any leakage of hazardous (e.g. explosive, toxic, hot) fluids (e.g. from the shaft seal) must be drained away so as to prevent any risk to persons or the environment. Statutory regulations are to be complied with.
- Hazards resulting from electricity are to be prevented (see for example, the VDE Specifications and the bye-laws of the local power supply utilities).
- The pumps' stability against falling over is not ensured unless it is properly mounted onto the tank.
- The female threads on the motor MUST NOT be used to lift the entire pump and motor assembly.

3.6 Safety instructions relevant for maintenance, inspection and assembly work

Any work on the machine shall only be performed when it is at a standstill, it being imperative that the procedure for shutting down the machine described in this manual be followed.
Pumps and pump units which convey hazardous media must be decontaminated.
On completion of work all safety and protective facilities must be re-installed and made operative again.
Prior to restarting the machine, the instructions listed under "Start up" are to be observed.

3.7 Signs on the pump

It is imperative that signs affixed to the machine, e.g.:

- arrow indicating the direction of rotation
- symbols indicating fluid connections

be observed and kept legible.

3.8 Unauthorized alterations and production of spare parts

Any modification may be made to the machine only after consultation with the manufacturer. Using spare parts and accessories authorized by the manufacturer is in the interest of safety. Use of other parts may exempt the manufacturer from any liability.

4 Transportation and Storage

Protect the pump against damage when transporting.
The pumps may only be transported in a horizontal position and hooks or straps must be attached on the motor and pump end.
Do not use the pump shaft for connecting any transportation aids such as hooks or straps.
Pumps must be drained prior to their storage.
Store pump in dry and protected areas and protect it against penetration of foreign bodies.
Always store pump above the freezing point!

5 Installation and Connection

5.1 Mechanical installation

During any assembly or disassembly process the pumps must be secured against tipping trough ropes for example at all times.

Pumps must be mounted securely. Piping, tank and pumps must be mounted without any tension.

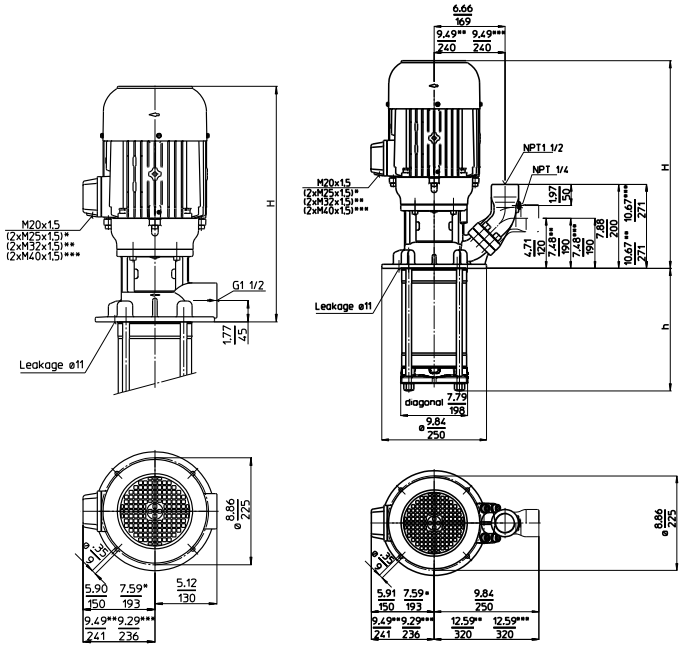
The inlet is at the bottom of the immersed pump body. The distance between the inlet and the tank bottom must be so large that the inlet cannot be blocked by deposits during longer shutdowns.

The leakage is collected in a leakage chamber and drained off by the leakage hole into the tank. During the assembling of the pump, be sure that the leakage hole is free.

To obtain the full flow rate it is recommended to choose for the pipework the nominal bore diameter of the pumps cross section for connection. Therefore pipe bends should be used, not pipe angles!

The pipework must be qualified for occuring hydraulic pressure.

TH11...17 STH11...17



Dimensions in Inches / mm
*) Dim. for 6.7 HP to 13.8 HP , **) Dim. For 17 HP
*) Dim. Up *23* HP

ATTENTION

Pay attention of the max. tightening torque for piping connection

Type	Pipe connection	Cast iron
TH11…17	G 1 ½	110 ft. Lbs *(150 Nm)*
STH11…17	NPT 1 ½	110 ft. Lbs *(150 Nm)*

When installed the space around the pump must be large enough to provide sufficient cooling of the motor.

Do not prop up the pressure line via the joining socket.

The pump must be mounted in that way that rotating parts under the cover of the coolant tank can not be touched!

5.2 Electric wiring

All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board!

According to the European Standard EN809 a motor overload must be installed and properly set to the full load amps stated on the pump name plate.

It is the responsibility of the machine operator to decide whether or not an additional emergency switch must be installed.

5.2.1 Circuit

Tension voltage and frequency must correspond with the shown specification on the nameplate.

The pump must be wired so that a solid longterm electrical connection is ensured. Establish a solid ground connection.

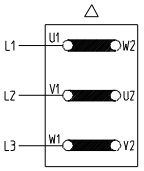
The electrical wiring must be performed according to the wiring diagram shown inside the terminal box cover. (Please see above sample wiring diagrams)

Wiring diagram e.g.

Up to 13.8 HP
Voltage changing 1:2 YY / Y
e.g. 230 / 460 V, 60 Hz

YY
Low Voltage

Y
High Voltage



17 Hp and higher
Delta connection
3 x 460 V, 60 Hz

There may be no foreign objects such as dirt, particles or humidity inside the terminal board.

Mount terminal board cover to motor tight against dust and humidity and close up all unused wiring ports.

ATTENTION

When Variable Frequency Drives are used interfering signals might occur.
Non-sinus shaped supply voltage from a variable frequency drive might result in elevated motor temperatures.

6 Start-up / Shut-down

6.1 Start-up

ATTENTION

Switch off at the mains.
After connection the electrical wires, close the terminal box. Briefly start the motor (max. 30 sec.) and check the rotation according to the arrow on the top of the motor.
If the direction is incorrect change over two of the power leads.

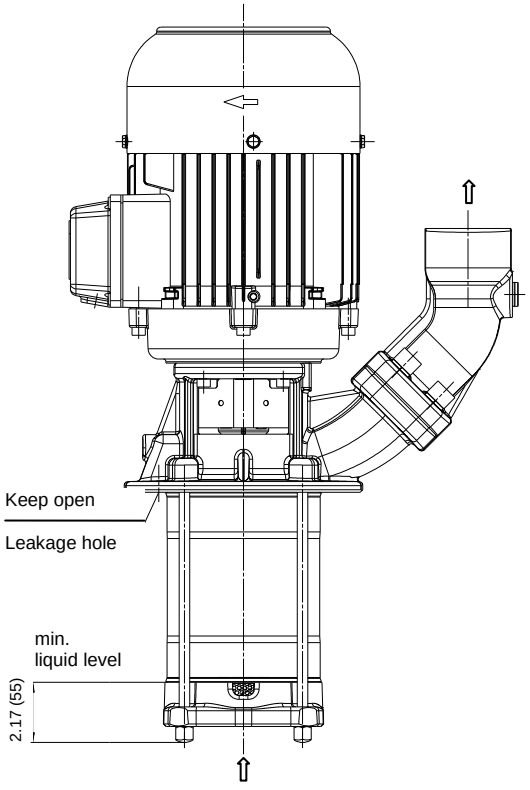
6.2 Shut-down

All service work must be carried out by qualified service personnel. Pump must be disconnected from the power source and all rotating parts must stand still. Reassure that pump is disconnected from power source and cannot be switched on. Verify that there is no voltage at the terminal board!
Open terminal box and disconnect the power leads.
Empty out the pump.

7 Operation

Liquid level

Be sure that the suction hole of the pump body is immersed about 2.17 Inches *(55 mm)* in the liquid (min. liquid level) before starting up the motor.



Dimensions in Inches *(mm)*

If the pump should lock up and cease, shut pump down (see 6.2) and disconnect from power supply. Pump must be uninstalled and removed from the system prior to its repair.

8 Servicing and Maintenance

ATTENTION

The surface of the motor must be kept free of dirt.

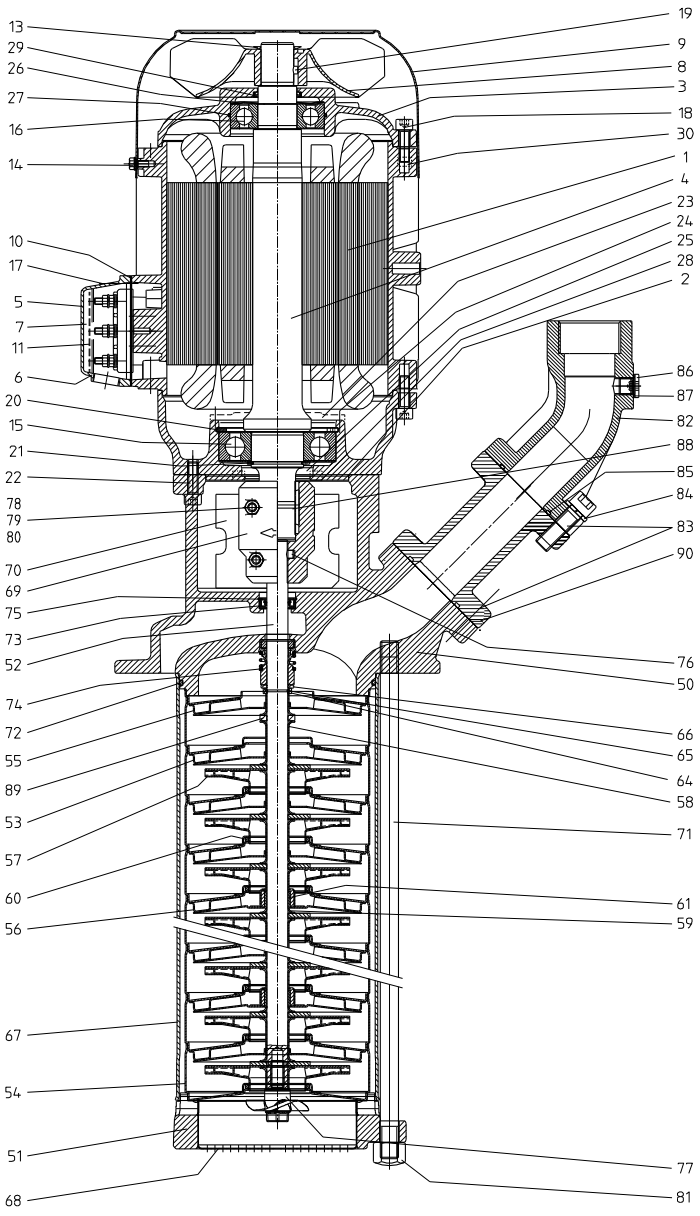
The motor shaft is spinning in permanently greased ball bearings (with special grease and increased bearing play) and does not require any special maintenance.

9 Troubleshooting Guide

Fault	Cause	Remedy
Motor does not start, no motor noise	At least two of the power supply leads have failed Overload has tripped	Check fuses, terminals and supply leads . Inspect overload
Motor does not start, humming noise	One of the supply leads has failed Impeller faulty Motor bearing faulty	See above Replace impeller Replace bearing
Overload trips	Pump locked up mechanically High on/of cycling frequency	Inspect pump hydraulics Check application
Power consumption is too high	Wrong direction of rotation of impeller Lime or other deposits mechanical friction	See above Clean pump mechanism repair pump
Motor overheats	High on/off cycling frequency Wrong power supply (voltage or cycles) Insufficient cooling	See above Power supply must correspond with name plate rating Check air flow at motor fan
Pump does not pump	liquid level too low Pump mechanism faulty Pipe blocked	Fill up liquid replace pump mechanism Clean pipe
Insufficient flow and pressure	Wrong direction of rotation of impeller Pump mechanism silted up Worn pump mechanism	Change over two power supply leads Clean pump mechanism Replace pump mechanism
Incorrect flow or pressure	Wrong power supply (voltage or cycles)	Power supply must correspond with name plate rating
Running noise/Vibration	Foreign objects in pump end Impeller damaged Bearing/Bushing broken	Remove foreign objects Replace impeller Replace bearing/bushing

10 Spare Parts

10.1 Spare Part List for the Immersion Pumps of the Series TH/STH11, TH/STH1402S180...1408S470

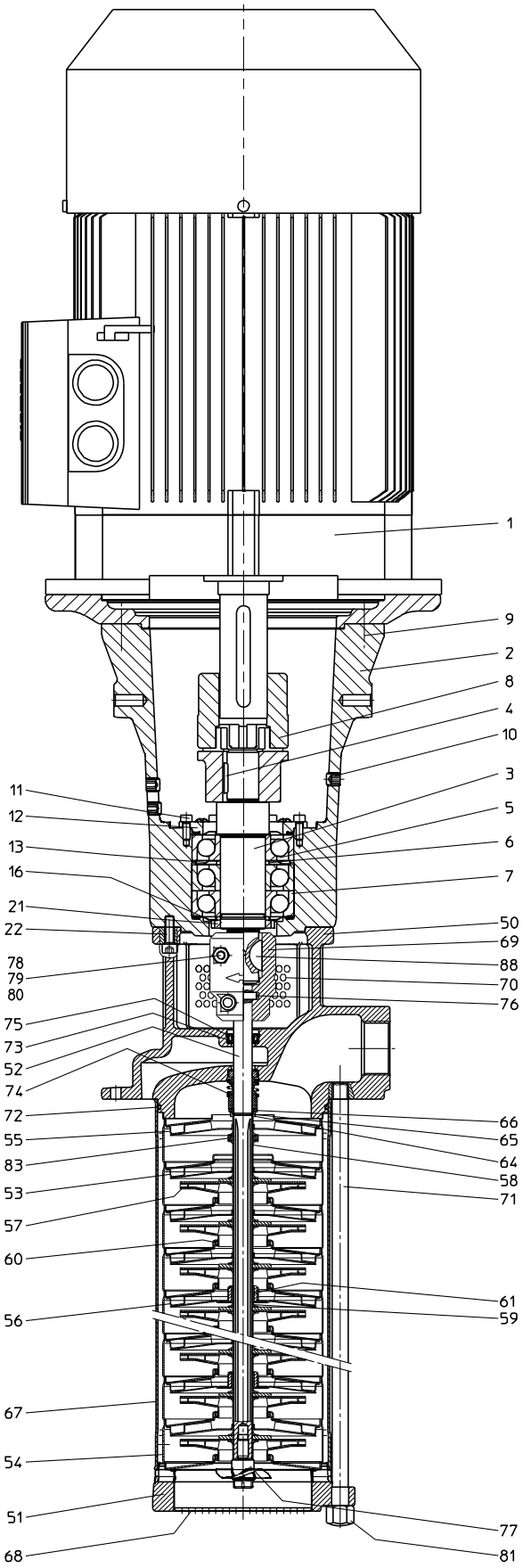


Item	Description	
78	Hexagon socket head cap screw	DIN 912
79	Serrated lock washer	DIN 6798
80	Hexagon nut	DIN 934
81	Hexagon cap nuts	DIN 917
82	Joining socket STH	
83	Socket head cap screw STH	DIN 912
84	Spring washer STH	DIN 7980
85	O-ring STH	
86	Screw plug STH	DIN 908
87	Sealing ring STH	DIN 7603
88	Woodruff key	DIN 6888
89	Distance plate instead of impeller at empty stage for special depth of immersion	
90	Adapter from 16 HP and over	

TH/STH1702S180...TH/STH1706S380

Item	Description	
1	Stator with terminal board	
2	Motor flange	
3	End shield	
4	Motor shaft with rotor	
5	Terminal box up to 5.4 HP	
6	Terminal box frame from 6.7 HP and over	
7	Terminal box cover from 6.7 HP and over	
8	Fan	
9	Fan cover	
10	Gasket	
11	Gasket from 6.7 HP and over	
13	Retaining ring	
13	Retaining ring 1.75…3.5 HP	DIN 471
14	Thread rolling screw	DIN 7500
15	Ball bearing	DIN 625
15	Ball bearing 1.75…3.5 HP	DIN 628
16	Ball bearing	DIN 625
17	Slotted cheese head screw	DIN 84
18	Hexagon socket head cap screw	DIN 912
19	Parallel pin	DIN 7
20	Retaining ring up to 7.4 HP	DIN 472
21	Retaining ring up to 7.4 HP	DIN 471
22	Socket head cap screw	DIN 912
23	Bearing cover from 10 HP and over	
24	Socket head cap screw 10 HP and over	
25	Shaft nut 10 HP and over	
26	Compensation disk	
27	O-ring	
28	Shaft seal from 10 HP and over	
29	Rotary shaft seal	
30	Nut from 16 HP and over	DIN 934
50	Pump body	
51	Intake cover	
52	Pump shaft	
53	Diffusor with sliding ring	
54	Entering stage with sliding ring	
55	Outflow stage	
56	Bearing stage with sliding ring	
57	Impeller	
58	Spacer-long 2 x per stage	
59	Spacer-short 1 x per bearing stage	
60	Sliding ring	
61	Shaft sleeve	
64	Mech. seal stop ring cover	
65	Mech. seal stop half-ring	
66	Mech. seal washer	
67	Pump casing	
68	Sieve	
69	Clamp coupling	
70	Coupling shield with M5 screw	
71	Stud bolt	
72	O-ring	
73	Rotary shaft seal	
74	Mechanical seal	
75	Retaining ring	
76	Parallel pin	DIN 7
77	Suction screw	

10.2 Spare part list for the immersion pumps of the series TH/STH1409S570...TH/STH1412S660 TH/STH1707S470...TH/STH1711S660



Item	Description	
1	Motor	
2	Bearing housing	
3	Bearing shaft	
4	Woodruff key	DIN 6888
5	Ball bearing	DIN 628
6	Distance plate	
7	Ball bearing	DIN 628
8	Coupling	
9	Socket head cap screw	DIN 912
10	Threaded pin	DIN 705
11	Bearing cover	
12	Socket head cap screw	DIN 912
13	Nilos-ring	
16	Nilos-ring	
21	Shaft nut	
22	Socket head cap screw	DIN 912
50	Pump body	
51	Intake cover	
52	Pump shaft	
53	Diffusor with sliding ring	
54	Entering stage with sliding ring	
55	Outflow stage	
56	Bearing stage with sliding ring	
57	Impeller	
58	Spacer-long 2 x per stage	
59	Spacer-short 1 x per bearing stage	
60	Sliding ring	
61	Shaft sleeve	
64	Mech. seal stop ring cover	
65	Mech. seal stop half-ring	
66	Mech. seal washer	
67	Pump casing	
68	Sieve	
69	Clamp coupling	
70	Coupling shield with M5 screw	
71	Stud bolt	
72	O-ring	
73	Rotary shaft seal	
74	Mechanical seal	
75	Retaining ring	
76	Parallel pin	DIN 7
77	Suction screw	
78	Hexagon socket head cap screw	DIN 912
79	Serrated lock washer	DIN 6798
80	Hexagon nut	DIN 934
81	Hexagon cap nuts	DIN 917
88	Woodruff key	DIN 6888
89	Distance plate instead of impeller at empty stage for special depth of immersion	

Design STH see page 9:

82	Joining socket STH	
83	Socket head cap screw STH	DIN 912
84	Spring washer STH	DIN 7980
85	O-ring STH	
86	Screw plug STH	DIN 908
87	Sealing ring STH	DIN 7603
90	Adapter from 16 HP and over	

10.3 Indications to the spare part order

Spare parts are available from the supplier.
Standard commercially available parts are to be purchased in accordance with the model type.
The ordering of spare parts should contain the following details:

1. **Pumptype**
   e.g. TH1407S470
2. **Pump No.**
   e.g. 08156414
   The date of the construction year is a component of the pumps type number.
3. **Voltage, Frequency and Power**
   Take item 1, 2 and 3 from the nameplate
4. **Spare part with item No.**
   e.g. Impeller item No. 57

11 Repair

11.1 Exchange the rotary mechanical seal: (S)TH11…(S)TH17

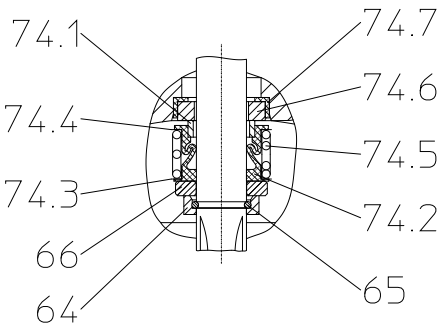
1) Disconnect the pump from the power supply.
2) Loosen the M5 screws and pull out coupling shield (70). Remove clamp coupling (69.1, 69.2) and parallel pin (76).
3) Loosen and pull off the hexagon cap nuts (81), the stud bolt (71) and the pump casing (67) from the pump unit. Remove pump unit with pump shaft (52) from the pump body (50).
4) Take off rotating axial face seal unit (74.1-74.5) and mech. seal washer (66) from the shaft (52) and clean the shaft. Pay attention to the drilled hole for the parallel pin (76) that it is without any bur. Check the sliding surface for the rotary shaft seal (73) for any damage.
5) Remove complete seal (74.6. 74.7) from the pump body (50) and clean the seat.
6) Mounting of the new axial face seal :
   Ensure that the sliding surfaces of the ring and the rotating axial face seal unit are free from grease and dirt.
   Moisten the angle-sleeve (74.7) of the counter ring lightly with rinse water / (water with washing-up liquid) and push the unit into the seat of the pump body (50).
   Slide the mech. seal washer (66) first and then the axial face seal (74.1-74.5) onto the pump shaft (52).
7) Lubricate lightly the lip of the rotary shaft seal (73) and push it into the pump body (50). Then insert the pump shaft (52) with the pump unit through the rotary shaft seal (73).
8) Fit together the coupling clamp (69) with the parallel pin (76) around the shafts, tighten the hexagon socket head cap screws (78) with the serrated lock washer (79) lightly.
   Be sure that the key of the motor shaft (4) coincides with the key groove of the coupling clamp (69.1). Press the pump shaft (52) toward the motor and tighten the screws.
   The distance between the two shaft ends **must be zero**.
9) Lubricate the O-ring seal (72) of the pump body (50), screw and put on the stud bolt (71), the hexagon cap nuts (81) and the pump casing (67).
10) Fit the coupling shield (70) into the pump body (50) and tighten the M5 screws.
11) Reconnect pump to the power supply**.**

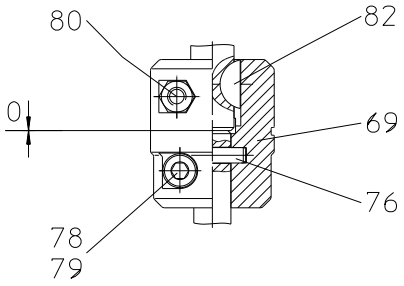
Note torques for the screw connections!

When putting the pump back into use, **make sure the direction of rotation is correct!**

Tightening torques for screwed connections

Thread - ∅	M4	M5	M6	M8	M10
Strength classes	4.8	4.8	8.8	8.8	8.8 / 10.0
Tightening torque ft. lbs. *(Nm)*	**0.7** ***(1)***	**2.2** ***(3)***	**3.3** ***(4.5)*** **15** ***(20)*** Clamp coupling	**11** ***(15)*** **22 (30)** Clamp coupling	**22** ***(30)***





12 Disposal

When disposing of the pump or the packaging materials the local and national regulation for proper disposal must be complied with.
Prior to its disposal, the pump must be completely drained and decontaminated if necessary.

13 WARRANTY

Brinkmann Pumps, Inc. warrants that the product contained herein conforms to the description in Brinkmann's catalog and that if this product shall fail to conform to the description thereof or to any express or implied warranty, Brinkmann shall, upon written notice of such nonconformity within one year of the date of its shipment from BRINKMANN'S plant, repair or replace such non-conforming material at the original point of delivery. Brinkmann will furnish instructions for disposition of the goods. If, however, Brinkmann provides a written warranty, as to this specific product, which is not in conformity to the above warranty, then as to such specific product, the specific written warranty shall prevail.

In addition to the warranty that this product will conform to the description in Brinkmann's catalog and that any such non-conforming material will be repaired or replaced, as above stated, BRINKMANN further warrants that it conveys good title to this product, free of all liens of any kind whatever unknown to the first Buyer. These are the sole warranties of BRINKMANN with respect to this product. BRINKMANN MAKES NO FURTHER WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS ARE HEREBY DISCLAIMED BY BRINKMANN AND EXCLUDED FROM THIS SALE.

The Buyer's exclusive and sole remedy on account or in respect of the product herein contained that does not conform to the description thereof, or to any express or implied warranty, shall be to secure replacement thereof as aforesaid. BRINKMANN shall not in any event be liable for the cost of any labor expended on any such material or for any special, direct, indirect, incidental or consequential damages to anyone by reason of the fact that such goods do not conform to the description thereof or to any express or implied warranty.